Toitu te Land whenua Information New Zealand

Crown Pastoral Land Tenure Review

Lease name : CLOUDY PEAK

Lease number : PO 104

Conservation Resources Report - Part 1

As part of the process of Tenure Review, advice on significant inherent values within the pastoral lease is provided by Department of Conservation officials in the form of a Conservation Resources Report. This report is the result of outdoor survey and inspection. It is a key piece of information for the development of a preliminary consultation document.

Note: Plans which form part of the Conservation Resources Report are published separately.

These documents are all released under the Official information Act 1982.

February 06

DOC CONSERVATION RESOURCES REPORT ON TENURE REVIEW OF

CLOUDY PEAK (P 104)

UNDER PART 2 OF THE CROWN PASTORAL LAND ACT 1998

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PART 1

INTRODUCTION

The Lessees of the Cloudy Peak Pastoral Lease (PL) have applied to the Commissioner of Crown Lands for a review of the property's pastoral lease tenure.

The 4256 ha property is located approximately 30 km north of Cromwell within the Ardgour Valley. The PL occupies the western slopes of the Dunstan Mountains and includes the catchments of Dry and Wainui Creeks.

The property sits between arable irrigated terrace country (from c.250m) and the snowgrass tops of the Dunstan Range at Cloudy Peak (1526m). The predominant terrain is moderately steep to steep slopes, with a balance of north and south lying country. The Dunstan Range mountain spur running north to south defines the eastern boundary, the Lindis River forms the western boundary, Dry Creek bounds the property to the south and the ridge north of Wainui creek marks the northern boundary. There is 4WD access throughout the property via the three leading spurs and along much of the Dry and Wainui Creek beds.

Cloudy Peak PL is in the Dunstan Ecological District, and is described in the survey report for the Lindis, Pisa and Dunstan Ecological Districts Protected Natural Areas Programme (PNAP) (Ward et al., 1994). No areas were recommended for protection on the PL.

Cloudy Peak PL was inspected by a team of specialists between 18 and 20 November 2002. Their findings are included in this report.

PART 2

INHERENT VALUES: DESCRIPTION OF CONSERVATION RESOURCES AND ASSESSMENT OF IMPORTANCE

2.1 LANDSCAPE

Cloudy Peak PL lies on the western slopes of the Dunstan Mountains. The Dunstan Mountains are tilted block mountains of schist, situated between the Upper Clutha and the Manuherikia valleys. The eastern escarpment rises moderately steeply from the Manuherikia basin. The western slopes have a pattern of low shallow valleys and ridges. The landscape becomes progressively subdued and indistinct with increasing altitude as the broad summit crests are reached. These summit crests are the remnants of a mid-tertiary peneplain surface.

Methodology

For this assessment, The Cloudy Peak PL has been divided into four landscape units (LU). Boundaries are defined principally by changes in topography, aspect and ground cover. The four units are:

- Alluvial Terraces (LU1)
- Dry Creek - south branch - upper & SW facing mid catchment area (LU2)
- Wainui Creek - upper and mid sections (LU3)
- Wainui Creek - north branch (LU4)

Each landscape unit is defined, and a description of landscape character in terms of landform, land cover and land use is given. An assessment of landscape values is made using the following criteria:

- Naturalness –an expression of the degree of indigenous content of the vegetative cover, and the extent of human intervention.
- Legibility –an expression of the clarity of the formative processes and how striking these physical processes are.
- Aesthetic values –includes the concepts of memorability and naturalness. Aesthetic factors that can make a particular landscape vivid include simplicity in landform, muted colours and fine textured ground cover.
- Historical values – areas containing high heritage importance.

The visual values or "visual amenity" of each unit is described and an assessment is made of each landscape unit's vulnerability to change.

2.1.1 Alluvial Terraces (LU1)

Description

This unit includes all of the alluvial terraces that step down from the hill country towards the Lindis River. Cone-shaped, schist covered hillocks which rise randomly above the terraces are a distinctive landform. The deep incisions of Dry and Wainui Creeks break the subdued topography before meandering over a gravel flood channel to drain into the Lindis River. The Lindis is one of the main tributaries of the upper Clutha River/Mata-au.

The terraces have been converted into intensive farmland, sown out in a mix of ryegrass, white clover and lucerne. The homestead and the farm utility buildings are sited within a pleasant setting of mixed exotic trees. Continuous pine shelter planting is present on Ardgour Road.

Landscape Values

The unit has moderately low landscape values due to the extensive conversion into farmland. This unit makes no contribution to inherent high country values.

Visual Values

The visual value of LU1 is limited due to the lack of physical relief and the screening created by the shelter planting along Ardgour Road.

Potential Vulnerability to Change

This unit is only moderately vulnerable to change. The long term survival of residual native species, such as a kowhai observed on dry southern footslopes, was the only threat to conservation objectives observed.

2.1.2 Dry Creek - south branch-upper & SW facing mid catchment (LU2)

Description

This unit comprises the whole of the upper catchment of Dry Creek and the southwest facing slopes of the catchment mid-section before it drains across a series of alluvial terraces.

The upper catchment is defined by the Dunstan Range summit ridgeline. The highest peak, Mt Kamaka (1,209m), bounds the property to the south. This conical peak is a distinctive natural feature, attributable to its castellated silhouette. Immediately below the summit ridgeline is a large V-shaped head basin. The basin is rounded in form due to the deep mantle of colluvium. The lower section of the head basin is characterized by a series of steep spurs separated by craggy gullies and large rock formations.

The landform changes from the dissected country into a long valley with parallel opposing ridgelines at the junction of Dry Creek and Daisys Creek. Daisys Creek

drains in from the neighbouring Ardgour property. The side slopes of the valley contain a constant surface profile. The base of these side slopes abut a series of alluvial terraces that have been bisected by the down cutting action of Dry Creek. Within the lower section of the valley, where the watercourse intermittently flows below the ground surface, Dry Creek is contained within steep-sided gravel banks.

Vegetative cover is strongly dictated by aspect, altitude and previous land management. Sunnier aspect slopes within the head basin are clad in tussock species with golden spaniard, tauhinu, false spaniard and coral broom also present. Close to the summit of the ridgeline the ground cover becomes depleted. Tall tussocks are smaller, soils thinner and climatic conditions harsher. Patches of wind erosion and the effects of a recent fire are evident. Tall tussock in the best condition occurs on the SE facing slopes. Intermittent flush zones support semi-modified turf communities.

A distinctive change in the ground cover occurs close to the 1,017m, indicating increased fertility. This is possibly a result of aerial oversowing and top dressing. Below this high point, upper side slopes are covered in a mix of introduced grasses and legumes, with residual pockets of grassland. Maori onion and golden spaniard are present, many showing signs of feral pig damage.

The mid and lower side slopes are covered in an irregular pattern of *Olearia* shrubland and introduced grasslands. The grassed areas are progressively being infilled by *Olearia odorata,* matagouri and sweet briar. In places the shrublands extend down over the valley floor where the wider terraces are covered in "clipped" introduced grasses with an occasional tuft of short tussock. The alluvial gravels along Dry Creek are colonized by matagouri, sweet briar and opportunist species such as foxglove and mullein. Within the creek's riparian zone there are occasional koromiko, prickly shield fern, elderberry and gooseberry. Wilding pines, some near cone-bearing size, dot the mid slopes.

Landscape Values

The landscape values contained within LU2 are in two separate sections. The upper catchment conveys high inherent values with natural systems and patterns dominating the landscape. The lack of "built" elements (e.g. dozed tracking) helps to reinforce the natural qualities. Mt Kamaka and the surrounding craggy outcrops are a significant feature and contrast markedly with the adjoining tussock-covered landforms. This upper section of the catchment makes a significant contribution to the natural landscape character of the Dunstans.

Below high point 1,017m the level of modification steadily becomes more evident. *Olearia* shrublands become increasingly disjointed, probably due to spraying and periodic patch burning.

Visual Values

Landscape Unit Two has moderate visual resource value. This is due to its being obscured from the local road network by the front ridges and footslopes. Parallel high ridgelines within this unit convey an overall sense of enclosure.

Potential Vulnerability to Change

This unit is moderately vulnerable to change Threats include:

- Uncontrolled spread of wilding pines.
- Woody shrubs being mechanically cleared, sprayed or patch burnt.
- Unsustainable grazing within the low alpine zone.
- Further earth disturbances, i.e. zigzag tracking over semi arid slopes.
- Riparian-zone damage caused by stock trampling steep gravely banks.

2.1.3 Wainui Creek – upper and mid sections (LU3)

Description

This unit incorporates the upper and mid section of the Wainui Creek (south branch). The unit contains a bowl-shaped head basin located below Cloudy Peak (1,526m). This head basin is different in character to the one within the adjoining Dry Creek catchment owing to the even grade of the colluvial side slopes. These give the landform a rounded and unvarying appearance. There are significant rock faces within the upper catchment and a few imposing buttresses jut out below the ridgeline. The actual summit of Cloudy Peak is distinctively dome-shaped.

The other major physical component within this unit is the entrenched valley separated by long rounded ridges. The side slopes of these ridges are typified by a moderate even grade, intermittently indented by temporary watercourses. This valley becomes more constricted before it links up with the north branch of the Wainui Creek at about 500m. The steeper southwest facing slopes are studded with occasional rocky outcrops and localized slumping which is indicated by hummocky terrain.

Vegetative cover can also be divided into three compositional groupings. The head basin is dominated by a uniform sward of snow tussock supported by alpine fescue grasslands and other inter-tussock species including golden spaniard and false spaniard. Close to the summit ridgeline there are large expanses of compact *Dracophyllum* shrublands. The summit of Cloudy Peak is clad in *Raoulia* cushion fields, *Dracophyllum* and pebble pavements. Within this low alpine zone there is spasmodic snow tussock. On the colder southeast side of Cloudy Peak there are infrequent snow banks.

Vegetation within the lower section of the V-shaped valley has been extensively manipulated by pastoralism. Semi-arid northeast-facing slopes are lightly covered in introduced grasses, short tussock, *Raoulia* sp, hawkweed and nettle. Expanses of this denuded land are pocked by old and recent rabbit warrens. On corresponding darker faces there is wide distribution of *Olearia* shrublands which have been controlled by spraying and patch burning. Aerial oversowing and top dressing has occurred on darker faces and a green flush is detectable below the ridgeline. Occasional wilding pines are scattered over the mid slopes.

The valley has been divided into a number of summer-run blocks. Many of the more recent fences are rabbit-proofed.

Landscape Values

Similar to LU2 the landscape values within LU3 should be subdivided into two segments. The head basin has high landscape values. This is due to the continuity and intactness of the tussock cover which results in a strong sense of uniformity.

The mid and lower sections of LU3 have moderate landscape values. Contributing features include the fragmentation of native shrublands on darker faces, and impoverished qualities of corresponding semi-arid faces due to depletion of vegetative cover and soil layers.

Visual Values

Landscape Unit 3 has moderately high visual resource values. This is attributable to the visibility of the summit of Cloudy Peak and adjoining ridgelines from State Highway 8, especially close to Bendigo.

Potential Vulnerability to Change

This unit is moderately vulnerable to change. Threats include:

- Spread of wilding pines.
- Unsustainable grazing within the low alpine zone.
- Woody shrubs being mechanically cleared, sprayed or patch burned.
- Further earth disturbances, i.e. zigzag tracking over semi arid slopes that will provide infiltration points for weeds.

1.2.4 Wainui Creek - north branch (LU4)

Description

This unit encompasses the whole north branch of Wainui Creek. The unit spans from the bowl-shaped head basin just below the crest of the Dunstan Range summit, descending gradually to where the creek's valley tapers and becomes more enclosed before opening out onto alluvial terraces.

The side slopes of the parallel long ridges that form the Wainui Creek catchment are constant in grade, being slightly indented by the watercourses that drain directly towards Wainui Creek. Dividing this valley and the adjoining Wainui Creek south branch is the prominent Centre Spur which stems directly from Cloudy Peak. Jutting from the side slopes within the mid section of the valley are imposing rocky outcrops. Occasional areas of rotational slumping occur just below the main ridgeline of the valley.
The vegetative spatial pattern duplicates that already described in LU2 and LU3, with dry north-facing slopes covered in patches of introduced grasses, short tussock, sweet briar, *Raoulia* and nettles. Hawkweed and thistle are continually colonising areas of bare ground. Opposing dark faces are clad in *Olearia* shrublands that are increasingly extending their normal geographic range. This is possibly due to the artificial build-up of the soil's fertility through top dressing with phosphate fertilizer. Medium-sized *Olearia* shrubs are rapidly infilling open grassed areas. Intermingled amongst the

Olearia are matagouri and sweet briar. *Olearia* shrublands also occupy the narrow section of the valley floor. Wider parts of the valley floor are covered in a random mix of introduced grasses, occasional tufts of short tussock and matagouri.

Landscape Values

A large proportion of LU4 conveys high landscape values. This is due to the sequence of various vegetation communities ranging from the tall tussock grasslands within the low alpine zone down to the montane *Olearia* shrublands. These shrublands are a notable botanical feature that contrast markedly with the degraded vegetative cover on opposing parched slopes. The *Olearia* shrublands also provide the wider high country landscape with diversity and recognizable local character, similar to the kanuka shrublands on Bendigo Station just south of the Cloudy Peak PL.

Visual Values

LU4 has moderately low visual resource value. Most of the Wainui Creek catchment is hidden from view by the front slopes that overlook the terraces. Glimpses of the summit of the Dunstan Mountains can be seen from State Highway 8.

Potential Vulnerability to Change

This unit is vulnerable to change. Threats include:

- Fragmentation of the regenerating *Olearia* shrublands through spraying and patch burning.
- Unsustainable grazing of the tall tussock grasslands within the low alpine zone.
- Spread of wilding pines.
- Further earth disturbances that will allow infiltration of weed species into more natural areas.
- Riparian damage.

Importance of the Landscape

The significant inherent landscape values of this property include landforms contiguous with the surrounding high country landscape and a complete altitudinal gradient of plant communities. Both contribute to the characteristics of the Dunstan Mountains.

Cloudy Peak's domed mountain crest, long rounded ridgelines separated by entrenched valleys, and terraces that step down towards the Lindis River are landscapes and landforms representative of the Dunstan Mountains. Associated with this variation in landform is an altitudinal sequence of plant communities. These include tall tussock grasslands that clad the summit and head basins, *Olearia* shrublands that dominate the darker side slopes of the valleys, and a mixture of semi-arid species that can tolerate the degraded conditions on the drier slopes. The lower terraces have been developed into intensive farmland.

2.2 LANDFORMS AND GEOLOGY

2.2.1 Background

The Dunstan Mountains typify the Central Otago pattern of fault-block mountain ranges uplifted along faults on their south eastern edges and tilted to the northwest. The smooth upland topography of the area with long gently sloping ridges on the northwest slopes and smooth crests of the range are the remnants of a mid-tertiary peneplain surface. Valley floor features in this area include extensive terraces of alluvial gravels and localised moraines formed as a result of successive advances of the Clutha glacier and intervening down cutting of the river.

The rock underlying most of the region is Haast schist which is commonly exposed as tors or outcrop towers of platy laminated rock. The basement rock of the property is chlorite subzone III and IV, well foliated quartz feldspathic schist and lesser chlorite schist. The lower terraces are derived from Pleistocene gravels and moraines, superimposed at the base of the schist zone with fan detritus.

2.2.2 Soils

Soils of the Dunstan Ecological District (ED) are derived mainly from Haast schist, loess and alluvial gravels. Underlying soils patterns are typically dominated by an altitudinal and rainfall sequence. Brown-grey earths have formed in the driest zone (<500mm rainfall). Yellow grey earths occupy the lower mountain slopes, grading into high country yellow/brown earths above 700-1000m. This sequence reflects increasing leaching and acidity with decreasing fertility. The valley floors include limited areas of recent soils on alluvium of flood plains and fans. Many have been intensively modified. These soils may contain pockets of soluble salts.

2.2.3 Importance of soils

No features of Importance have been identified on Cloudy Peak PL.

2.2 CLIMATE

The property experiences warm dry summers and cold frosty winters. Average rainfall at the homestead is 450mm rising to 800mm on the high back portion of the run, but this can vary considerably. Although rainfall is spread evenly, evaporation exceeds precipitation during the summer period. The northerly aspect and predominant northwest wind in spring and summer, mean the property dries out quickly. This leads to annual summer droughts and wind erosion on cultivated lands. Snow is present for short durations during the winter months and may lie to 1100m for several weeks.

2.4 VEGETATION

Five main habitat types were recognised for the purposes of vegetation description: river terraces, lower sunny faces, lower shady faces, headwater gullies, and summit

slopes. This section includes descriptions of the vegetation types; assessments of threatened species; problem plants, and botanical importance. A list of vascular plant species is contained in Appendix One.

2.4.1 River terraces: Wainui and Dry Creeks

Stable ground carries a close-cropped turf of pasture species and weeds dominated by sweet vernal (*Anthoxanthum odoratum*) and browntop (*Agrostis capillaris*), with prominent sheep's sorrel and clovers (*Trifolium repens, T. fragiferum, T. dubium*). There are patches of shrubland dominated by *Olearia odorata* and matagouri (*Discaria toumatou*) with variable amounts of briar (*Rosa rubiginosa*) and Muehlenbeckia (*Muehlenbeckia complexa*). Several large trees of *Olearia lineata* survive in Dry Creek, and there are a few crack willow (*Salix fragilis*) trees in the lower reaches of both catchments. Silver tussock (*Poa cita*) and the sedge *Carex buchananii* are scattered in the turf, mainly along stream banks. Stony riverbeds support sparse vegetation of scabweed (*Raoulia australis*), *Muehlenbeckia axillaris*, woolly mullein (*Verbascum thapsus*), sheep's sorrel (*Rumex acetosella*), Scotch thistle (*Cirsium vulgare*), bidibidi (*Acaena* species), and other herbaceous species.

2.4.2 Lower sunny faces

Sunny faces below about 1000 m elevation are much degraded, and between about 50% and 80% of the soil surface is bare. The sparse vegetation comprises mainly small herbaceous species, of which scabweed (*Raoulia australis* and *R. beauverdii*), native oxalis (*Oxalis exilis*), storksbill (*Erodium cicutarium*), and sheep's sorrel are the most prominent. Scotch thistle is common. At low elevations there are extensive areas of nettle (*Urtica urens*), often in association with scattered shrubs of *Olearia odorata* and matagouri. Rock outcrops support more diverse vegetation, with a higher density of shrubs including *Olearia odorata*, matagouri, porcupine shrub (*Melicytus alpinus*), briar, mingimingi (*Coprosma propinqua*), and native broom (*Carmichaelia petriei*). Golden spaniard (*Aciphylla aurea*) is prominent around rock outcrops, especially toward the upper altitudes of this habitat type. One kowhai tree (*Sophora microphylla*) was seen, but there are apparently a few others on the footslopes of the main spurs (Peter Anderson, leaseholder, *pers. comm.*).

2.4.3 Lower shady faces

Shrubland of variable density covers much of the lower shady faces, dominated by *Olearia odorata* with usually less frequent matagouri, mingimingi, and briar. Muehlenbeckia is common on the shrub canopy, and a few elder trees (*Sambucus nigra*) occur near the creek courses. Ground cover vegetation is generally close-cropped pasture grasses and weeds, dominated by sweet vernal, browntop, sheep's sorrel, catsear (*Hypochoeris radicata*) and clovers. There are extensive patches of silver tussock amongst the shrubland at mid-altitudes, and hard tussock (*Festuca novae-zelandiae*) appears on upper slopes near the ridge crests.

2.4.4 Headwater Gullies

The upper reaches of Dry Creek and Wainui Creek have steep sides with many rock outcrops. These support relatively dense, tall (3-4 m) shrubland of *Olearia odorata*, matagouri, and mingimingi, and relatively little briar. Muehlenbeckia and bush lawyer (*Rubus schmidelioides*) are frequent on the shrub canopy. Bush lawyer is also frequent on outcrops where bracken (*Pteridium esculentum*) is also common. Three plants of koromiko (*Hebe salicifolia*) and two of tauhinu (*Ozothamnus leptophyllus*) were recorded in Dry Creek, but were not seen elsewhere in this habitat. Vegetation under the shrub canopy is more varied than in shrublands of more open slopes, and includes prickly shield fern (*Polystichum vestitum*) as well as pasture grasses and many herbaceous weeds. Where the vegetation is only lightly grazed by herbivorous mammals, mostly in the humid environment at streamsides in the gully floors, a relatively diverse flora of mainly exotic herbaceous species exists. These include creeping bent (*Agrostis stolonifera*), cocksfoot (*Dactylis glomerata*), Chewing's fescue (*Festuca rubra*), jointed rush (*Juncus articulatus*) soft rush (*J. effusus*), musk (*Mimulus moschatus*), silver tussock, willowherb (*Epilobium* species), *Isolepis aucklandica*, *Linum catharticum*, and wall lettuce (*Mycelis muralis*).

2.4.5 Summit Slopes

Above about 1000 m, degraded slopes merge into those that retain variable cover of hard tussock and, above the upper limit of oversowing, increasing amounts of narrow-leaved snow tussock (*Chionochloa rigida*). Above 1200m, hard tussock is replaced by alpine fescue (*Festuca matthewsii*) and blue tussock (*Poa colensoi*). The upper slopes are dominated by short (c. 20-50 cm) narrow-leaved snow tussock with about 20-40% cover, but golden spaniard is prolific in places. Sunny slopes have up to 30% bare soil. As well as alpine fescue and blue tussock, prominent intertussock species include *Raoulia subsericea*, patotara (*Leucopogon fraseri*), mouse-eared hawkweed (*Hieracium pilosella*), tussock hawkweed (*H. lepidulum*), false Spaniard (*Celmisia lyallii*), and *Dracophyllum pronum.* Coral broom (*Carmichaelia crassicaule*) is scattered throughout, and there are patches of *Carmichaelia vexillata*, generally around outcrops. Approximately 100 ha of snow tussock grassland had been recently burnt south of Cloudy Peak, removing most vegetation apart from tussock and golden spaniard, both of which were regenerating from their bases.

On the shoulders of Cloudy Peak, narrow-leaved snow tussock grades into slim snow tussock (*Chionochloa macra*). On shady slopes, the tussock shares dominance with *Dracophyllum pronum.* On sunny slopes the tussock is only scattered through vegetation dominated by *Celmisia sessiliflora.* Solifluction terraces on the east side of the summit are characterised by *D. pronum* and lichens. Plants found only on the outcrops and boulderfields of the summit include *Hebe pauciramosa*, *Senecio lautus* subsp. *discoideus*, *Coprosma cheesemanii*, *C. petriei*, *C. ciliata*, *Chionohebe densifolia*, and *Pimelea oreophila.*

The saddles along the summit ridge have erosion pavement fellfield that is approximately 70% bare substrate. The oppressed vegetation here comprises small cushions and clumps of *Raoulia youngii*, *Celmisia sessiliflora*, *Poa colensoi*, *Myosotis pulvinaris*, *Anisotome imbricata*, *Colobanthus strictus*, *Luzula pumila*,

Kelleria dieffenbachii, and *Leptinella pectinata*, along with other small herbaceous plants, lichens, and bryophytes.

There are a few flushes and snow banks in the snow tussock grassland. These support *Psychrophila obtusa*, *Ranunculus gracilipes*, *Oreobolus pectinatus*, *Coprosma perpusilla*, *Euchiton traversii*, *Plantago triandra*, *Colobanthus apetalus*, and *Phyllachne colensoi*, along with expanses of mosses and lichens. Moist grassland around and below flushes contains the few shrubs of tauhinu observed other than in the gully of Dry Creek.

2.4.6 Problem Plants

Much of the flora of Cloudy Peak PL comprises weedy exotic species, however none are of great conservation concern. The two hawkweed species are well established throughout. Briar is found throughout the shrublands, but is seldom dominant. A few mature wildling pines (*Pinus ponderosa*) were seen.

Importance of Vegetation

Shrublands:

Olearia odorata shrublands on Cloudy Peak PL were not recorded during the 1984-85 PNAP survey by Ward et al. (1994), but have developed since the mid-1980s. This has possibly occurred as a result of increased application of fertiliser (Peter Anderson, leaseholder, *pers. comm.*). The shrublands are widespread on the PL, and form a characteristic vegetation type that is uncommon elsewhere in the Ecological District. Dunstan RAP A2, about 20 km to the north, and Dunstan RAP B1, 30 km to the north (Ward et al. 1994), contain somewhat similar vegetation, shrubland in which mingimingi, *Olearia odorata* and matagouri are prominent.

The lower slopes of Cloudy Peak PL fall within the kanuka-kowhai woodland woody biome (240-440 m) identified by Walker et al. (2002). Here *Olearia odorata* is likely to have been abundant in canopy gaps in kanuka (*Kunzea ericoides*) and kowhai dominated woodland. Kanuka is now absent here, but is abundant at Bendigo Station approximately 15 km to the south (Ward et al. 1994). Other species attributable to this kanuka-kowhai woodland are present on Cloudy Peak PL.

The work of Walker et al. (2002) indicates kanuka-kowhai-Hall's totara forest would dominate at higher altitude (450-730 m) in the vicinity of Cloudy Peak PL, and kowhai-Hall's totara forest above this elevation zone (700-860 m). Species associated with these vegetation types present on Cloudy Peak PL include mingimingi, porcupine shrub, matagouri, *Carmichaelia petriei*, and *Olearia odorata*. Hall's totara and other species of Walker's higher elevation kowhai-Hall's totara forest are now absent, although old totara logs are present on the property, particularly at the head of Wainui Creek.

In the absence of fire and grazing, the main constraint to the re-establishment of representative kanuka-kowhai woodland, kanuka-kowhai-Hall's totara forest, and

kowhai-Hall's totara forest, on Cloudy Peak PL appears to be the lack of local seed sources for several woody species.

Tussock grasslands:

Above the existing continuum of shrubland from low to mid altitudes, especially on shady faces, reasonably intact tussock grassland extends to the highest point on Cloudy Peak PL. The presence of such grassland is rare on the north-western aspect of the Dunstan Mountains. Ward et al. (1994) described a single narrow zone of narrow-leaved snow tussockland present in the west in Dunstan RAP A1, that they considered significant. Although snow tussock grassland on Cloudy Peak PL is much reduced in stature and density as a result of fire and grazing, it is still predominantly indigenous in character and has the potential to recover substantially in the absence of these factors.

Sequences:

The more or less continuous sequence of predominantly native vegetation over the entire altitudinal range on parts of Cloudy Peak PL is unusual, particularly on this aspect of the Dunstan Mountains. No similar sequences were identified or recommended for protection by Ward et al. (1994), presumably because in the 1980s shrubland was much sparser at low elevations.

Threatened or significant species:

Hitchmough (2002) classifies *C. vexillata* and *C. crassicaule* as in gradual decline. Other significant species present on Cloudy Peak PL are *Raoulia parkii* (gradual decline) *Acaena buchananii* (gradual decline) and *Raoulia beauverdii* (sparse) (Hitchmough, 2002).

2.5 FAUNA

2.5.1 Invertebrate Fauna

Insects and other invertebrate fauna recorded on Cloudy Peak during the inspection are listed in Appendix Two. Specimen collections were limited due to cold conditions in the early part of the inspection period.

Predatory ground beetles, such as *Oregus aereus*, were present throughout the property from low to high altitudes. The alpine cockroach *Celatoblatta quinquemaculata* was found in good numbers high on Cloudy Peak and also lower down in Dry Creek. Widespread species such as the grasshopper *Sigaus australis*, the grass moth *Orocrambus corruptus* were abundant in suitable habitats. The stoneflys *Stenoperla maclellani, Zelandoperla decotrata,* and the mayfly *Deleatidium lilli* were abundant in the creeks.

Importance of invertebrates

Despite poor collecting conditions, good numbers of common invertebrate species were present as would be expected wherever good habitat for those species was present. The invertebrates recorded are predominantly indigenous and representative of the natural character of the western side of the Dunstan Ecological district.

2.5.2 Herpetofauna

Lizard habitat surveyed included valley floors, hill slopes and ridges between 360m and 1500m. Particular attention was given to rock bluffs and rock outcrops. The modified pasture land on the lower parts of the property lacked potential lizard habitat and was not surveyed. Three species of lizard were found.

- McCann's skink (*Oligosoma maccanni*) was common and widespread throughout the property, generally in association with rocks and short dense vegetation.

- The gecko *Hoplodactylus* sp. "Cromwell Gorge" was widespread and abundant in rock bluffs and outcrops below 900m. This species demonstrates an altitudinal gradient in morphology. Specimens on the valley floors grow to 50-55mm in body length, have depressed (flattened) build and very narrow toes. Those on ridges and upper hillsides grow to 60-62mm are less depressed in build with slightly wider toes.

- The third species *Hoplodactylus* sp. "Otago/Southland Large" was common and abundant in rock bluffs and outcrops between 900-1300m .

The head basin of Dry Creek extending down to below the forks held particularly good numbers of both skinks and geckos. Upper Centre Spur had areas of good rock tors with good numbers of skinks. Geckos (*Hoplodactylus* spp.) were present wherever there was adequate habitat in the form of rock slabs or vegetation.

The Dunstan Mountains are one of very few places in the southern South Island where two distinct species from the *H. maculatus* complex co-exist. Within the Dunstan Mountains area both species show considerable geographic variation in appearance. This is quite unique. Cloudy Peak PL contains abundant populations ranging from the lowlands to the natural altitudinal extreme at 1300m. These populations include excellent examples of this geographic variation. The area includes, for example, good numbers of the very small lowland form of *H.*sp.'Cromwell Gorge' which are smaller than those observed elsewhere. Good numbers of geckos were found along the zone where the two species are in contact.

Importance of Herpetofauna

The lizards on the PL are representative of the Dunstan Mountain gecko fauna. Each is relatively common and widespread in Central Otago, and none is considered to be threatened. Both species of gecko exhibit minor morphological variations which are

unique to the Dunstan Mountains. These variations have not been accorded separate conservation value.

The altitudinal sequence observed on Cloudy Peak PL is important. The Dunstan Mountains are one of the few places where two distinct species from the *H. maculatus* complex co-exist. This is the first site where *H.* "Cromwell Gorge" and *H.* "Otago-Southland large" have been reported actually in contact (R. Hitchmough, *pers.comm.*).

2.5.3 Avifauna

Birds that were seen during on this inspection are listed in Appendix Three. There were no recorded sightings of birds with conservation importance.

2.5.4 Aquatic Fauna

No previous freshwater fish records for the Cloudy Peak Pastoral Lease were found on the National Institute of Water and Atmospheric Research Freshwater Fish Database prior to the inspection. However, a fish survey of Dry Creek and Wainui Gully was carried out for the Department of Conservation in 2001. Results of that survey are consistent with the results of the tenure review inspection (refer Appendix Four).

During the tenure review inspection two sites were surveyed in Dry Creek and four sites on Wainui Creek. Each site was sampled using a backpack electric fishing machine and defined criteria (Allibone, *in prep*). Habitat measurements were taken and recorded as set out in a NIWA freshwater data form. In-stream invertebrates were noted when they could be identified, but no specific collection was undertaken.

Neither Dry Creek nor Wainui Creek provided a continuous water flow to the Lindis River. Dry Creek appears to be ephemeral and a water take for irrigation on Wainui Creek removes available water. Wainui Creek must at times flow into the Lindis River, as reasonable numbers of brown trout were present in the creek. The middle reaches of Wainui Creek and the head waters of both Dry and Wainui Creeks appeared to have permanent water.

Three fish species were present on Cloudy Peak Station. These were *Galaxias* sp D, Upland bully (*Gobiomorphus breviceps*) and brown trout (*Salmo trutta*)

Dry Creek

The lower of the two Dry Creek sites surveyed had no fish or invertebrates. It appeared that permanent surface water would be present only at times of higher flows. Filamentous green algae were present suggesting that nutrient inputs to the stream may be moderate-high.

The upper site had a stable cobble / boulder type substrate, with shrub vegetated riparian margins. No fish were found. High numbers of invertebrates were recorded

giving a high Macro Invertebrate Community Index (MCI) value which indicates good water quality. Mayflies were the dominant invertebrates noted. Caddis and stone flies were also present.

Wainui Creek

Four Wainui Creek sites were surveyed: two on the main stem, one on a tributary, and one on a water race. Fish were found at all sites except in the water race. There appeared to be no in-stream values in the water race which suggests it may not flow all year round. The lower reach of the Wainui Creek had no water at the time of the survey.

The side tributary was a small (1m width) cobble/boulder type stable stream which during summer periods may be reduced to residual pools. Low numbers of upland bully and brown trout were present. Invertebrate numbers were also low with only mayflies (*Deleatidium*) present.

Two sites were fished in the main stem of Wainui Creek. The top site had an enclosed riparian margin with a cobble/coarse gravel mix substrate. The bed appeared to be stable. The lower site was more open and the exposed river bed was dominated by coarse gravel substrate. Both sites had *Galaxias* sp D, brown trout and upland bully. Mayflies (*Deleatidium, Nesameletus*) were the dominant invertebrates. Caddis flies and stoneflies were also present suggesting good water quality.

Importance of Aquatic Fauna

Galaxias sp D is ranked Nationally Vulnerable (Hitchmough, 2002). This species occurs in four populations clusters in the Clutha River catchment and in areas of the Catlins District. Genetic data indicates that the different clusters, while all part of the *Galaxias* sp D group, are distinct. It is recommended that these clusters be treated as distinct until further information is available.

Galaxias sp D is subject to a recovery plan which requires protection of 30 populations/streams of even geographic distribution. As there are not yet 30 known populations, each new population identified has significance for protection. The Wainui Creek population is the southern most population of *Galaxias* sp D on the Dunstan Range. Geographically, this Wainui Creek population provides an important link between the populations in the Chain Hills and a single population at Bannockburn.

The Upland bully is probably the most common and wide spread bully in the South Island. Its name is some what misleading, as the fish may occur commonly at quite low altitudes. Its distribution is best regarded as inland rather than upland. (McDowall, 1990).

A small resident population of brown trout are present in Wainui creek. The size of the fish would suggest that they were not of particular interest as a nursery population for larger waters in the area (Clutha, Lindis). Fish passage issues also exist due to de-watering in the lower section of the stream.

2.5.5 Problem Animals

Rabbits have been a major problem on Cloudy Peak PL which was previously under the Rabbit and Land Management Programme. There has been a major rabbit netting programme on all main fences. Small numbers of goats, pigs and fallow deer can be found on the property and some evidence of pig damage was found during the vegetation survey. Possums are also a problem.

2.6 HISTORIC

2.6.1 Sites

On Cloudy Peak there is a reported Maori oven on the flats (site G41/20)[1], the paddock has now been well ploughed many times. There is a small water race (G41/23)[2] of unknown age in Dry Creek. There is also a hut ruin (G41/24)[3] and a stone chimney ruin (G41/25)[4]. None of these sites is of sufficient Importance to merit special protection beyond that which exists under the provisions of the Historic Places Act.

2.7 PUBLIC RECREATION

2.7.1 Physical Characteristics

The Cloudy Peak PL sits on the gently sloping western flanks of the Dunstan Mountains. The PL provides potential access to the summit area of the Dunstan Range and to the adjacent Ardgour Conservation Area.

The easy terrain of the summit area of the Dunstan Ranges is suited to a range of back country activities including walking, horse riding, mountain biking and 4WD activities. The upper area of the PL with its associated sense of remoteness, provides opportunities for back country type experiences.

The DOC Recreation Opportunity Spectrum (1992), classified recreation opportunities in the Otago region by setting, activity and recreational experience characteristics. The back part of the Cloudy Peak PL lies in a "*Backcountry Four Wheel Drive In*" zone, which is characterised by a sense of remoteness and a highly natural setting. In this zone, Four Wheel Drive vehicles are identified as giving access to high country tussock grasslands, Block Mountains and more rugged remote areas. The lower part of the property is zoned *Rural* which recognises a strongly human-modified nature but with open space characteristics of the area. Driving for pleasure, horse riding, walking and picnicking are identified as common activities in such areas.

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[1] NZMS G41 Site No. 20 as described in NZ Archaeological Association Records
[2] NZMS G41 Site No. 23 as described in NZ Archaeological Association Records
[3] NZMS G41 Site No. 24 as described in NZ Archaeological Association Records
[4] NZMS G41 Site No. 25 as described in NZ Archaeological Association Records

The open space characteristics of the Cloudy Peak area are also identified in a Federated Mountain Clubs publication "Outdoor recreation in Otago – A Recreation Plan" (Mason, 1989). This document identified much of the area surrounding Cloudy Peak as "Open Space" and identifies management priorities such as retaining and extending rights of public access through the zone, and protecting isolated features such as summit tor landscapes.

2.7.2 Legal Access

Legal Access to the property is from Ardgour Rd which bisects the bottom edge of the property. A marginal strip lies along the boundary of the Lindis River at the bottom edge of the PL. Access to the summit area is also possible through adjoining conservation land, previously Ardgour PL

2.7.3 Activities

The property provides access opportunities from Ardgour Road to the top of the Dunstan Range, access along the crest of the Dunstan Mountains to associated backcountry, and access to the neighbouring Ardgour Conservation Area. This area is attractive to walkers, horse riders, mountain bikers and 4WD enthusiasts. Expansive landscape vistas from the top of the Dunstan Ranges include the Old Man Range, the Pisa Range and the glacial landscape of the Clutha and Upper Clutha Valleys.

Available recreation opportunities include:

- Four wheel driving, mountain biking, horse riding and walking on Cloudy Peak PL.
- Opportunities for a round trip up Dry Creek and over into Wainui creek on formed farm tracks.
- Opportunities for longer trips to Cloudy Peak and the upper reaches of the Dunstan Mountains.
- A track along the back boundary of Cloudy Peak continues along the length of the Dunstan Mountains from Thompsons Gorge to the Lauder Basin. Cloudy Peak occupies a convenient mid way position.
- Some hunting opportunities exist. Feral pigs and goats are found on the property and evidence of pig rooting was noted during the tenure review inspection. Occasional deer and Californian Quail are also found on the property.
- Ski touring possibilities exist in good snow years
- Access to the Lindis River from the Ardgour Road is available by crossing lower paddocks.

PART 3

OTHER RELEVANT MATTERS & PLANS

3.1 CONSULTATION

Cloudy Peak PL was discussed at an NGO early warning meeting held in Alexandra on 19th September, 2002 and at a further NGO meeting held in Alexandra on 22nd May 2003. Some NGO representatives have also inspected the property. The main points raised during the meeting and in subsequent submissions were:

Federated Mountain Clubs (FMC)

- This moderate sized property is important as part of possible Dunstan Tops Conservation Area. It would link with conservation land ex. Ardgour and with Lauder Tussock Reserve.
- Need secure legal access along tops from Mt Kamaka to Cloudy Peak and northwards along the range to Lauder Reserve.
- Need secure legal access to Cloudy Peak summit from Ardgour Road via one of the farm tracks.
- Foot and mountain bike access should be as of right, 4WD access with permission.
- Dunstan tops above about 1000m to become conservation land (subject to SIV).

FMC also made a written submission. A full copy is attached as Appendix Five. The key findings and recommendations (abbreviated) of that submission are:

- Key issue for this tenure review is public use of the track along the back boundary of Cloudy Peak. This continues along the length of the Dunstan Mountains and Cloudy Peak occupies a key position mid way along the ridge top routes between new public access over former Ardgour leasehold land and the Lauder Basin Conservation Area further north.

- A corridor along the ridge from the northern boundary of the proposed Ardgour conservation area over Cloudy Peak summit and to the property boundary north of Cloudy Peak contains an important area of alpine herbfield and provides access along crest of range.

- Access required for walking along the banks of the Lindis.

- Access is required for tramping, MTB and horse trips along the crest of the Dunstan Mountains northward from Thompsons Saddle and along the crest from Mt Kamaka to northern boundary of Cloudy Peak and The Point, down centre spur and Wainui Creek valley or down the Dry Creek valley.

- Access down the tongue spur provides options for round trips.

- May be possible in the future to gain access via Beggs Creek and the Thompson Gorge Rd to Matakanui.

- Landscape values of the higher country including the crest of the Dunstan Mountains, Mt Kamaka, Cloudy Peak and the upper catchments of Wainui Creek and Dry Creek are the primary conservation interests associated with enhancing the recreational experience.

- Need to make provision for car parking off highways and in most secure places possible near the start of new easements over land which become freehold through TR.

- Upper catchment of Dry Creek has high inherent landscape value and significant potential for shrubland recovery and would provide recreational access opportunities.

- Extensive areas of remnant shrubland and degraded scrub add to the biodiversity of the property. Remnant shrublands near Wainui Creek and on lower shady faces in Wainui Creek might be considered for protection.

- Herbfield in the vicinity of Cloudy Peak summit might be considered for protection.

4WD Club

- Concerned the existence of conservation areas will stop and/or limit vehicles going from one property to another and through the conservation area.

Public Access New Zealand (PANZ)

- In the absence of access through adjoining freehold land, access is needed through the PL to Tarras Road.
- Public access is needed up north boundary which is suitable for mountain bikes.
- Beggs Creek on Freehold good access.
- Issues of staying within boundary.
- Ideal opportunity for horse access.
- If other access is provided requirements for access here may lapse as it would not be needed anymore.
- Impressive mountain tor landscape.
- Marginal strips?
- Access from road to river bed is important for fisheries and conservation values.
- Access up northern boundary advocated however there are issues with this track going into neighbours and alternate access.

- Possibility of 4WD access up Dry Creek but the practicality is not clear.

Fish and Game

- Upland game resource in shrublands.

General

- An ecological sustainability issue exists over much of lower part of property

The Royal Forest and Bird Protection Society of New Zealand Incorporated

Forest and Bird made a written submission. A full copy is attached as Appendix Six. The key findings and recommendations (abbreviated) of that submission are:

- Cloudy Peak together with Ardgour to South and Cluden to North appear to have a climate of their own.

- Vegetative cover is less modified in upper reaches of Dry Creek and vegetation becomes more diverse and alpine near the top of Cloudy Peak. Cloudy Peak PL carries an interestingly high level of *Olearia odorata* apparently to exclusion of matagouri as not as much young matagouri was seen as could be expected.

- Land in these areas should return to Crown control:
  - Land above 1200m around Cloudy peak which has variety of vegetation
  - Headwaters of Dry Creek with shrublands which would give depth to North Dunstan CA
  - Rock structures on true left and above head of Dry Creek which have landscape value
  - Vegetation on slopes to north of Wainui Creek
  - As much *Olearia odorata* as possible

- The overall landscape is typical of the area, some of the rock outcrops are spectacular and the change from exotic to tussocklands is a feature of this landscape.

- Key access routes from Ardgour Valley Road to Cloudy Peak up Wainui creek and centre spur and from Cloudy Peak to Thomsons Gorge which would provide for a round trip and; Access from Thomsons Saddle to the Lindis via Cloudy Peak must be preserved.

- Access from Lindis valley to Manuherikia valley up Dry Creek across Thomson's saddle should be preserved for historical reasons.

Southern Lakes Branch of the New Zealand Deerstalkers Association

NZDA submitted that:

- Access for hunting with firearms and dogs (apart from places where this would be a hazard to local birdlife) must be maintained. Pig and occasional red deer can be found in this area with existing access from Ardgour Road.

3.2 Regional Policy Statements & Plans

The Regional Policy Statement for Otago provides a policy framework for all of Otago's significant regional resource management issues. It does not contain rules. District Plans shall not be inconsistent with the Regional Policy Statement.

In respect of natural values the Regional Policy Statement includes the following policy and method:

Policy: To maintain and where practicable enhance the diversity of Otago's significant vegetation and significant habitats of indigenous fauna, trout and salmon...

> *Method: Identify and protect Otago's significant indigenous vegetation and significant indigenous habitat of indigenous fauna, trout and salmon, in consultation with relevant agencies and with Otago's communities.*

In respect of landscapes and natural features it includes the following policy and method:

Policy: To recognise and provide for the protection of Otago's outstanding natural features and landscapes.

> *Method: Prepare in conjunction with relevant agencies and in consultation with the community and affected landowners, an inventory of outstanding features and landscapes that are regionally significant.*

3.3 District Plan

Cloudy Peak Pastoral Lease is located within the Rural Resource zone of the Central Otago District Plan. In general, the proposed Central Otago District Plan (amended to incorporate Council decisions) does not act as a trigger for the protection of tussock grasslands and smaller wetlands and forest areas. Resource consent is required for excavations or tree planting within specified distances of a water race or irrigation pipeline, and for development work within 10m of any water body.

There are no registered historic sites, or areas of significant indigenous vegetation and habitats of significant indigenous fauna and wetlands as set out in the schedules of the plan. Protection is limited to the controls set out above.

3.4 Conservation Management Strategy & Plans

The Otago Conservancy of DOC has prepared a Conservation Management Strategy (CMS) which was approved by the New Zealand Conservation Authority in August 1998.

The CMS identifies 41 special places of conservation interest in Otago Conservancy. The Cloudy Peak Pl lies in the North Dunstan Special Place. The CMS objectives for the North Dunstan Special Place as these are relevant to Cloudy Peak are:

To extend protection in the area to cover the remaining higher altitude areas of nature conservation importance, and to secure appropriate public access.

The key implementation methods relevant to Cloudy Peak are:

- Pastoral lease tenure review on properties in the area may provide opportunities to negotiate to protect the areas of interest. Overall management of these new areas with the existing conservation areas will confer net conservation and management benefits.
- Research or survey work will be encouraged where it increases our understanding of the natural processes operating in the reserve or assists with management
- Opportunities to legalise public access points and develop appropriate public facilities will be explored. Once access is improved, public awareness of the area can be increased.
- Attempts will be made to negotiate as of right public foot and mountain bike access to high altitude protected areas.

Priorities for the North Dunstan Special Place are:

The negotiation of protection arrangements for areas of biodiversity importance and recreational opportunities and access are the priority activities in this special place

3.5 New Zealand Biodiversity Strategy

The New Zealand Government is a signatory to the Convention on Biological Diversity. In February 2000, Government released the New Zealand Biodiversity Strategy which is a blueprint for managing the country's diversity of species and habitats and sets a number of goals to achieve this aim. Of particular relevance to tenure review, is goal three which states:

Maintain and restore a full range of remaining natural habitats and ecosystems to a healthy functioning state, enhance critically scarce habitats, and sustain the more modified ecosystems in production and urban environments, and do what is necessary to:

> *Maintain and restore viable populations of all indigenous species across their natural range and maintain their genetic diversity.*

The strategy outlines action plans to achieve this goal covering terrestrial and freshwater habitat and ecosystem protection, sympathetic management, pest management, terrestrial and freshwater habitat restoration, threatened terrestrial and freshwater species management, etc.

PART 4

MAPS ETC

4.1.1 REFERENCES

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4.1 ILLUSTRATIVE MAPS

MAP 1 Topographic and cadastral boundaries

MAP 2 Ecological & historic resources

MAP 3 Landscape units and significant inherent landscape values.